



# Water



# Water Cleaner

## Introduction

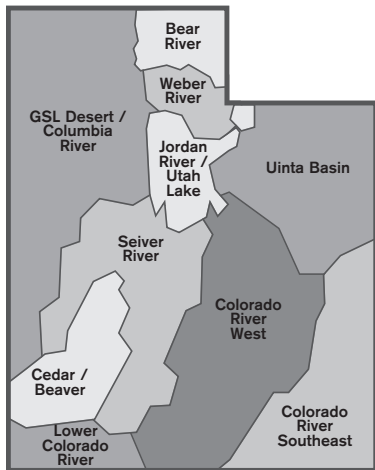
Water is a precious resource in Utah, the second driest state in the nation. Some 2.5 million residents and thousands of visitors depend on surface and groundwater for drinking. Utah's 14,250 miles of rivers and streams, and nearly 3,000 lakes and reservoirs, sustain a wide variety of wildlife, provide recreation and enjoyment, and support agriculture production.

Utah has made significant strides in protecting water resources since passage of the 1972 federal Clean Water Act and the implementation of wastewater discharge permits that have reduced lake and stream pollution. Challenges remain, however, including pollution in runoff, changes to water flow, airborne pollutants settling into water, and addressing aging wastewater and drinking water infrastructure.

This chapter highlights the condition of Utah's waters and watersheds and the quality of the drinking water.

The **Water Quality Board** guides the development of water quality policy and regulations in the state. The **Division of Water Quality** administers the laws and rules and is responsible for wastewater loans. The board is made up of various interests groups across the state, as defined by statute in the Utah Code, Section 19-5-103. Like the other Boards, members are appointed by the governor, with the consent of the Senate. For more information on the Board and its members visit: [www.waterquality.utah.gov/WQBoard/wqb\\_members.htm](http://www.waterquality.utah.gov/WQBoard/wqb_members.htm)

#### Utah Watershed Management Areas



## Water and Watersheds

A watershed is a geographic area in which all the water drains into a common waterway such as a river, lake or stream. Watersheds are susceptible to pollution in two ways that are commonly classified as point or non-point sources. An example of a point source is a wastewater treatment plant that discharges treated water directly into a stream, whereas non-point source pollution generally refers to runoff from the land, as a result of impacts from agriculture, storm water or air pollution settling in water. The Division of Water Quality (DWQ) uses a five-year rotating monitoring process to assess the water quality of rivers and streams within the state. The states have been divided into 10 watershed management units and these have been aggregated into five monitoring regions that are designed to cover the state every five years.

### Condition of Utah's Waters

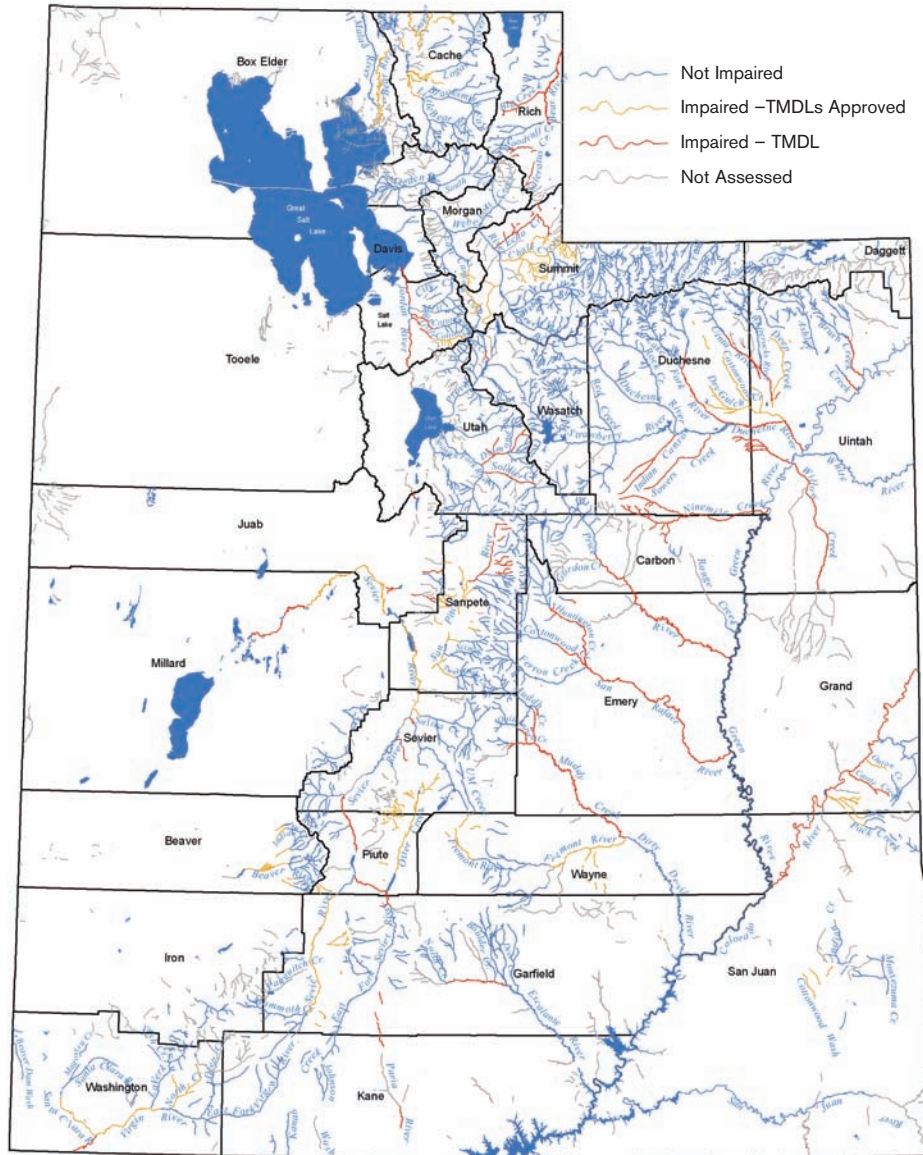
Under section 303(d) of the Clean Water Act, Utah must assess the condition of its waterways and provide a list of "impaired" waters. It then must prepare a restoration plan based on a "Total Maximum Daily Load" (TMDL) study that calculates the maximum amount of pollution a body of water can receive in order to still meet water quality standards.

As of 2006, the Utah Division of Water Quality (DWQ) has examined approximately 10,442 miles of perennial streams to assess the water's ability to fully or partially support aquatic life or recreational uses. Of those stream miles assessed, 72 percent were found to support fish or be safe for swimming, and 28 percent determined to have some form of water quality impairment.

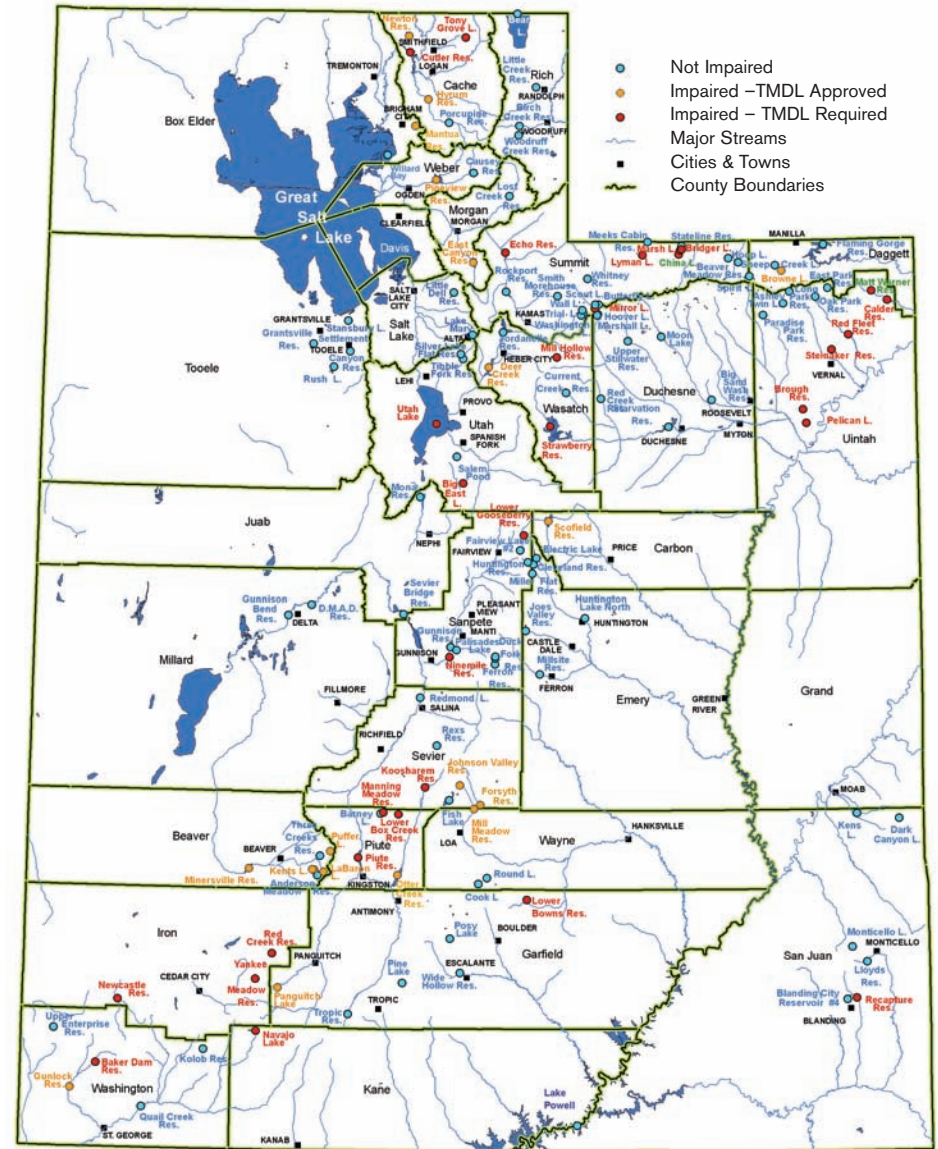
### Utah Lakes

As of 2006, DWQ has assessed 97.1 percent of the total lake acreage in the state. The majority – 99.4 percent – of those assessed were found to be either fully or partially supportive of aquatic life and other uses. Only 0.06 percent was found to be impaired, largely because of excessive nutrient levels from non-point sources such as agricultural and industrial runoff. Of the 132 lakes surveyed, 32 are on the 303(d) list. Two of these, Cutler Reservoir and Pelican Lake, were added for the first time. Several lakes remain under additional stress due to drought conditions.

## 2006 Utah Perennial Stream Assessment

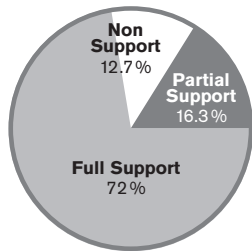


## 2006 Utah Lake Assessment



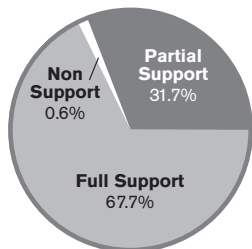
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**Statewide Rivers & Streams Use Support**  
10,442 Miles of Perennial Streams



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**Statewide Lake Beneficial Use Support**  
2006 305(b) Assessment



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## Permitting Surface Water Discharges

The state of Utah has been delegated authority by EPA to administer the National Pollutant Discharge Elimination System (NPDES) program. Under this program permits are issued to all entities that discharge pollutants to surface waters, including discharges of domestic and industrial wastewater and storm water to protect the quality of our waters for drinking, recreation, agriculture and wildlife. Currently, there are over 2,000 active storm water permits.

DWQ currently oversees 271 domestic and industrial discharge permits. These permits typically require daily sampling of the discharge to determine if it meets the water quality requirements that are imposed. Monthly reports are submitted to validate compliance within the parameters of the discharge permit. Currently there is a 97 percent compliance rate for all the regulated domestic and industrial facilities.

Under the NPDES program, construction projects that disturb more than 1 acre of land must receive a storm water permit to assure that proper practices are in place to protect sediment-laden runoff from polluting any nearby surface water. Storm water permits for construction activities are pertinent only through the duration of the construction and may be secured on-line. The permit outlines the "best management practices" that must be followed during construction. Inspections are performed by DWQ staff to verify that appropriate management practices are in place. DWQ also performs education and outreach activities to assist permittees meet their obligation to prevent water pollution.

The NPDES program also requires storm water permits for industrial facilities that are defined as significant sources of contaminated storm water runoff. The facilities are issued coverage under the "Multi-Sector General Permit for Storm Water Discharges from Industrial Facilities." The permit requires the industry to develop a storm water pollution prevention plan and to conduct annual inspections of their facilities to insure that exposed materials are not contaminating storm water discharging from facilities.

Storm water permits are also required for municipal separate storm sewer systems which serve populations greater than 10,000 people or which are located within urbanized areas. These permits require the entity, usually cities, to develop a system-wide storm water management program that includes developing ordinances, stream surveys of discharge pipes into waters of the state and educational programs. Eighty-four Utah communities and jurisdictions fall into this category. For more information on NPDES, visit: <http://cfpub.epa.gov/npdes/>.



### Chalk Creek Success Story

**Chalk Creek**, which flows into Echo Reservoir in northern Utah, was placed on the **303(d) list** in 1997, and was considered the third most polluted stream in the state. Excessive **erosion** resulting from uncontrolled grazing and flood irrigation contributed to high levels of phosphorus and suspended solids were found in the creek. Committed to improving the watershed, more than 90 local landowners worked with project partners to successfully restore the creek. Some landowners were able to fence the stream banks to keep livestock out of the creek and plant willows and other native vegetation around the stream. But some projects weren't as simple. Some landowners, in danger of losing a barn or a home to erosion, which were willing to reroute streambeds and stabilize the banks to prevent erosion. These efforts significantly improved Chalk Creek. As of 2004, roughly 106,000 tons of sediment had been prevented from entering the stream, achieving an 82 percent reduction goal in phosphorus and sediment entering the creek. Occasional fish-stocking studies revealed that fisheries have been enhanced in Chalk Creek for **Bonneville Cutthroat trout**, a threatened species.

Before



After

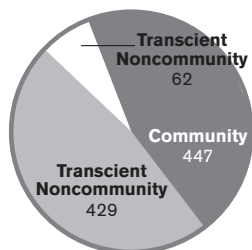




Photo: Division of Drinking Water

**The Utah Drinking Water Board adopts and enforces rules related to public drinking water systems. The Division of Drinking Water administers the rules. For more information on the rules and laws governing the board, visit:**  
[www.drinkingwater.utah.gov/rules.htm](http://www.drinkingwater.utah.gov/rules.htm)

**Active Public Water Systems in Utah**



## Drinking Water

The vast majority – 97 percent — of Utahns drink water from approved public water systems, while some individuals and businesses get their drinking water from private wells. National drinking water standards apply to public water systems, which include municipalities and privately-owned water systems. National health-based standards exist for about 90 regulated contaminants.

### Public Drinking Water Systems

Utah has 938 public water supply systems. A public water system is defined as any water system, either publicly or privately owned, which provides drinking water for 15 or more connections, or 25 or more people, at least 60 days of the year. These include community systems serving people year round; non-transient non-community water systems that serve workers at a factory, and transient non-community water systems such as seasonal campgrounds or highway rest stops.

All sources of drinking water used by community and non-transient non-community systems in Utah are required to have a Drinking Water Source Protection (DWSP) Plan. DWSP Plans define the watershed or subsurface area that contributes drinking water and the plan contains a protection strategy that reduces the risk of accidental contamination of a water source. Generally, transient non-community systems are not required to have a full source protection plan, but each, at the least, has a Source Water Assessment, which is essentially a simplified source protection plan.

The figure on the top right of the next page shows the percentage of systems in the state that are fully covered by completed Source Water Assessments<sup>2</sup> (SWAs). The data comes from the Division of Drinking Water's 2006 Annual Report to the Environmental Protection Agency (unpublished). It's important to recognize that systems are always developing new sources, which means that the number of sources/systems with approved SWAs changes regularly. As of October, 2006, 95 percent of people served by Community Water Systems in Utah get their water from sources with completed and approved SWAs, a very high success rate.

## Water System Ratings and Operator Certification

Water system ratings are based on the quality of the water the system provides, how well operated the system is, and how well maintained the system facilities are. Almost everyone in Utah gets their water from an “Approved” drinking water system.

In order to become a Certified Operator, a person must be trained in many aspects of the management of a water system, and must pass a test that measures understanding of how to operate a water system. Certified Operators are recertified every three years, and have to attend continuing education. There are over 2,000 certified operators working in Utah. Most Utahns get their water from systems with Certified Operators.

The figure to the bottom left shows that as the number of approved systems and certified operators has increased over the last 13 years, the number of enforcement actions has declined. Well trained operators and approved systems mean better water systems and fewer chances that the public could be exposed to contamination. Unapproved systems, or systems without appropriately certified operators, receive ongoing assistance from the Division of Drinking Water and the Rural Water Association to help them improve their operations.

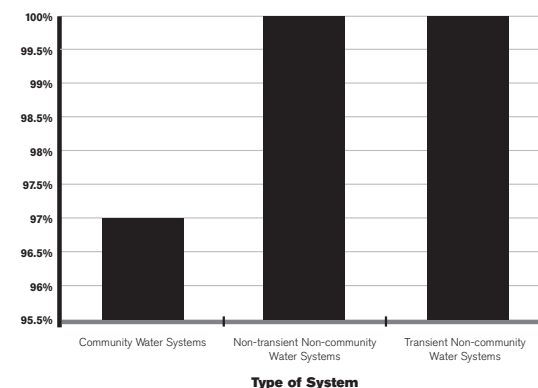
## Public Health Threats to Drinking Water

DDW has seen measurable success over the last 16 years in improving compliance with drinking water requirements. The Safe Drinking Water Act mandates that EPA, states, and water systems protect consumers from the risks of unsafe drinking water. It has been over two decades since a water borne disease outbreak has been reported in Utah.

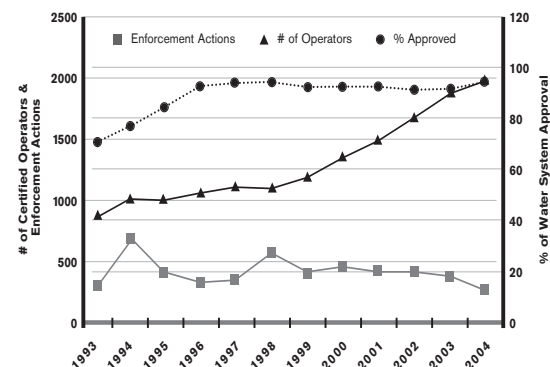
Contaminants can enter drinking water supplies at the source of supply, during construction, from illegal cross-connections with non-potable water supplies (irrigation water), leaching from household plumbing, and from poor operational practices. Public water suppliers must properly treat and disinfect water. Contaminants in drinking water can have both immediate and long term health effects. As an example, drinking water contaminated with pathogens can result in stomach pain, diarrhea, headache, vomiting and fever in a matter of hours after consumption, while other chemicals and naturally occurring minerals may cause cancer, impair fetus development, or cause other longer term health effects, but only after several decades of consumption.

Visit the Division of Drinking Waters web site at [www.drinkingwater.utah.gov](http://www.drinkingwater.utah.gov), in order to learn more about the various drinking water programs.

**Percentage of Water Systems Covered by SWAs**



**Approved Systems, Certified Operators and Enforcement Actions**





### **West Haven Success Story**

In the mid-1990s, the 4,000 residents of Weber County's **West Haven** had an overflowing problem: Many septic tanks were full and spilling into open drain ditches, creating foul odors and a major health problem. Today, the city has a new wastewater collection system connecting area homes and businesses to the Hooper wastewater treatment plant. The nearly \$12 million project was funded by a zero-interest loan from the **State Revolving Fund Loan Program**, administered by the **Water Quality Board**. West Haven residents pay \$30 to \$40 a month in sewer bills, a fraction of what it would have been without the loan program, according to city officials.

## **Utah's Water Loan Programs**

Since 1972, some 280 municipal wastewater projects have received funding from U.S. Environmental Protection Agency grants, the State Revolving Fund (SRF) or the Utah Wastewater Project Assistance Program – which includes the Utah Wastewater Loan Program and the Hardship Grant Fund. To date, these projects have totaled more than \$575 million. These loans have helped communities improve wastewater treatment plants, extend sewer and water lines to homes previously not served, eliminate failing septic systems and build water towers – all that have helped eliminate existing environmental pollution problems and protect public health. Information about financial assistance for wastewater projects can be found at: [www.waterquality.utah.gov/FinAst/index.htm](http://www.waterquality.utah.gov/FinAst/index.htm).

Since 1983, the Utah Drinking Water Board has funded 289 projects, totaling \$169 million. These loans have helped to construct new treatment plants, replace aging pipes, and develop new sources of water (wells and springs). These projects have helped with economic growth and protected the public's health. Information about financial assistance for drinking water projects can be found at: [www.drinkingwater.utah.gov/loan\\_program\\_intro.htm](http://www.drinkingwater.utah.gov/loan_program_intro.htm).

Several of the drinking water projects funded by the Drinking Water Board have been to regionalize or consolidate several smaller water companies into one larger one. Kane County Water Conservancy District and Central Iron County Water Improvement District have both recently helped several small water systems that had compliance problems by combining them into a larger entity. The larger consolidated systems are more efficient, more streamlined, and more cost effective, and most importantly, more protective of public health.

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## **Groundwater Management**

Groundwater is found below the surface in spaces between rocks and soils. Many rural communities are served by public drinking water systems that depend on groundwater, private wells and groundwater systems for their water supply.

Groundwater also is a source of water for industrial and agricultural uses. A groundwater discharge permit is required for facilities which could discharge pollutants into groundwater. Currently, there are 36 active groundwater discharge permits regulating about 150 facilities.

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## Groundwater Protection

As development in Utah continues the potential for groundwater contamination increases. Once contaminated, groundwater is difficult to clean, and it oftentimes requires great expense. A continued effort is made to encourage local governments to institute groundwater protection measures and the Division of Water Quality has helped garner over \$1 million per year to fund non-point source projects for groundwater protection.

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## Perchlorate in Utah

Perchlorate is an unregulated compound that is increasingly found in the environment. It can occur naturally but it is primarily a byproduct of industrial uses, such as solid rocket fuel.

Since 1997, DEQ has identified some sites with perchlorate contamination in the groundwater. DEQ is working with the facilities to assess the magnitude and extent of the contamination, and manage exposure pathways. For additional information about perchlorate, visit: [www.perchloratenews.com/index.html](http://www.perchloratenews.com/index.html).

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## Community Partnerships

Utah water officials work cooperatively with federal and local partners to ensure the state's water sources are free of pollution and contamination. These partnerships bring together interested stakeholders to develop plans to better solve environmental problems.

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## Great Salt Lake Water Quality Steering Committee

The Great Salt Lake is a unique terminal lake adjacent to a growing metropolitan area. The lake is also a critical ecological resource as well as an important recreational and mineral resource. Working with a stakeholder committee, DWQ has begun a process to establish numeric standards for the Great Salt Lake, with an initial focus on selenium. Public concern over the potential of adding more selenium to the lake as a result of the Southwest Jordan Valley groundwater cleanup project brought a renewed focus on the need for numeric standards. Under the committee's oversight, a science panel will look at the existing selenium studies on the lake and conduct additional work where necessary. The committee will consider a science panel's work and then make a recommendation to the Water Quality Board. If the Board accepts the recommendation, the standard will be sent out for public comment before the action becomes final. Visit [www.deq.utah.gov/issues/GSL\\_WQSC/index.htm](http://www.deq.utah.gov/issues/GSL_WQSC/index.htm) for more information.

### **Jordan Valley Success Story**

In April 2006, the cities of West Jordan, South Jordan, Riverton and Herriman started receiving water from a new reverse osmosis treatment plant, a first phase of a years-long effort to provide more than 8,000 acre-feet of water per year through Southwest Jordan Valley Groundwater Project. For years, DEQ, Jordan Valley Water Conservancy District, Kennecott Utah Copper Corp. and EPA worked together to develop a project that captures deep underground waters impacted by mining and other activities, purify it and make it a source of drinking water for the communities in the southwestern Salt Lake Valley. Kennecott paid for the cost of developing and treating the underground water by a trust fund, managed by the executive director of DEQ, acting as the Trustee for Natural Resources. Jordan Valley and Kennecott developed the project which is overseen by the trustee and other regulatory agencies. Many have hailed this project as the most significant project in America because of the high level of cooperation between the entities involved.

### **Perchlorate Success Story**

Perchlorate has contaminated the aquifer that Magna Water and Sewer Improvement District uses for part of its water supply. Magna Water and Sewer Improvement District has worked with the company that caused the source of contamination, and state and federal officials to determine a unique method of treating the contaminated source of water to make it drinkable and dispose of the waste stream with a biologically safe method.

### **Arsenic Success Story**

When EPA's new arsenic limits in drinking water went into effect on Jan. 23, 2006, the vast majority of Utah's water utilities were already in compliance. But a few systems are still working on achieving the higher standard. DDW is working with those Utah systems, and in some cases it has granted three-year extensions to make necessary adjustments to ensure compliance with the new 10 parts per billion (ppb) standard – much lower than the 50 ppb that was once considered safe to drink.

## **Mercury Work Group**

Mercury is also a cause of concern for the Great Salt Lake. The Mercury Work Group (see next chapter on Mercury) is a group of stakeholders that convene to coordinate mercury studies that are ongoing. For more information on the group, visit [www.deq.utah.gov/Issues/Mercury/workgroup.htm](http://www.deq.utah.gov/Issues/Mercury/workgroup.htm).

## **Working with Animal Feeding Operators to Control Runoff**

In 1999, the U.S. Department of Agriculture and the EPA released a joint unified strategy to address runoff from animal feeding operations (AFOs). Following the release of a national strategy, DWQ organized a Utah AFO committee to develop a workable strategy for Utah, an innovative approach that is recognized nationally. State Program partners include the Utah Department of Agriculture, Utah Farm Bureau Federation, Utah Association of Conservation Districts, Utah State University Extension, and the National Resources Conservation Service. Animal operations that confine their animals, such as dairies, are the focus of the strategy. In the national strategy, all operations with animal units equivalent to or greater than 1,000 mature beef cattle are automatically considered Concentrated Animal Feeding Operations (CAFO). Smaller operations with polluted runoff problems can also be defined as CAFOs and are required to complete nutrient management plans and acquire a discharge permit.

Utah allows smaller operations a window of opportunity to fix problems and come into compliance while still qualifying for federal grants, an opportunity regulated operations do not receive. The strategy includes technical assistance to farmers and ranchers writing Comprehensive Nutrient Management Plans (CNMPs). It also requires implementation of best management practices and funding opportunities, and on-farm assessments of all animal operations in the state.

By 2004, essentially all on-farm assessments of 2,893 operations had been completed. The vast majority – 2,054 – had no water quality problems. Of the 380 potential CAFOs, 112 have completed CNMPs and 50 have implemented their plans and were taken off the potential CAFO list.

The Utah AFO Strategy document can be viewed at: [www.waterquality.utah.gov/documents/DOC\\_RULE.htm](http://www.waterquality.utah.gov/documents/DOC_RULE.htm), along with many other documents pertaining to Division of Water Quality activities. Other information about the issue can also be found at the following Web sites: [www.ut.nrcs.usda.gov](http://www.ut.nrcs.usda.gov), [www.uacd.org](http://www.uacd.org) and [www.ag.state.ut.us](http://www.ag.state.ut.us).



### Feedlot Runoff Success Story

A Department of Agriculture video illustrated the following successes: In 2004, Jon Beck completed a CNMP that involved building a runoff retention dike below the slope of his feedlot located in Utah County, next to the Spanish Fork River. In Summit County, the Brown's Dairy and Summit Valley Milk Production facility, a 350 cattle dairy production, is located on a slope that presents a challenge to control runoff. Glen Brown built a scraping ramp that allows the manure to flow down to a storage area. It's configured in such a way that all runoff is funneled into one central area away from nearby streams. In Morgan County, Mike Morgan and his nephew, Jason, run a 500-cow mother cow-calf operation in Stoddard. They farm 600 acres of irrigated cropland and ranch 12,000 acres of grazing land. It's the feedlot near the creek that presented problems. Morgan fenced off the creek, built a dike to keep runoff out of it and built water troughs away from the creek so the cattle won't enter the creek for water.

#### Before (Beck)

435 lbs Nitrogen/Yr  
221 lbs. Phosphorus  
1,647 lbs BOD



#### After (Beck)

57 lbs Nitrogen/Yr  
28 lbs. Phosphorus  
206 lbs BOD



- 1 Data (as text and in graphics) in this report section was obtained from Division of Drinking Water databases, August 2006.
- 2 Defined by EPA as a source with an approved delineation of protection zones, an approved susceptibility assessment, and approved public notification. Note that this figure includes both Drinking Water Source Protection Plans and also the Source Water Assessments completed by DDW for transient non-community water systems.